MISSOURI BOTANICAL GARDEN
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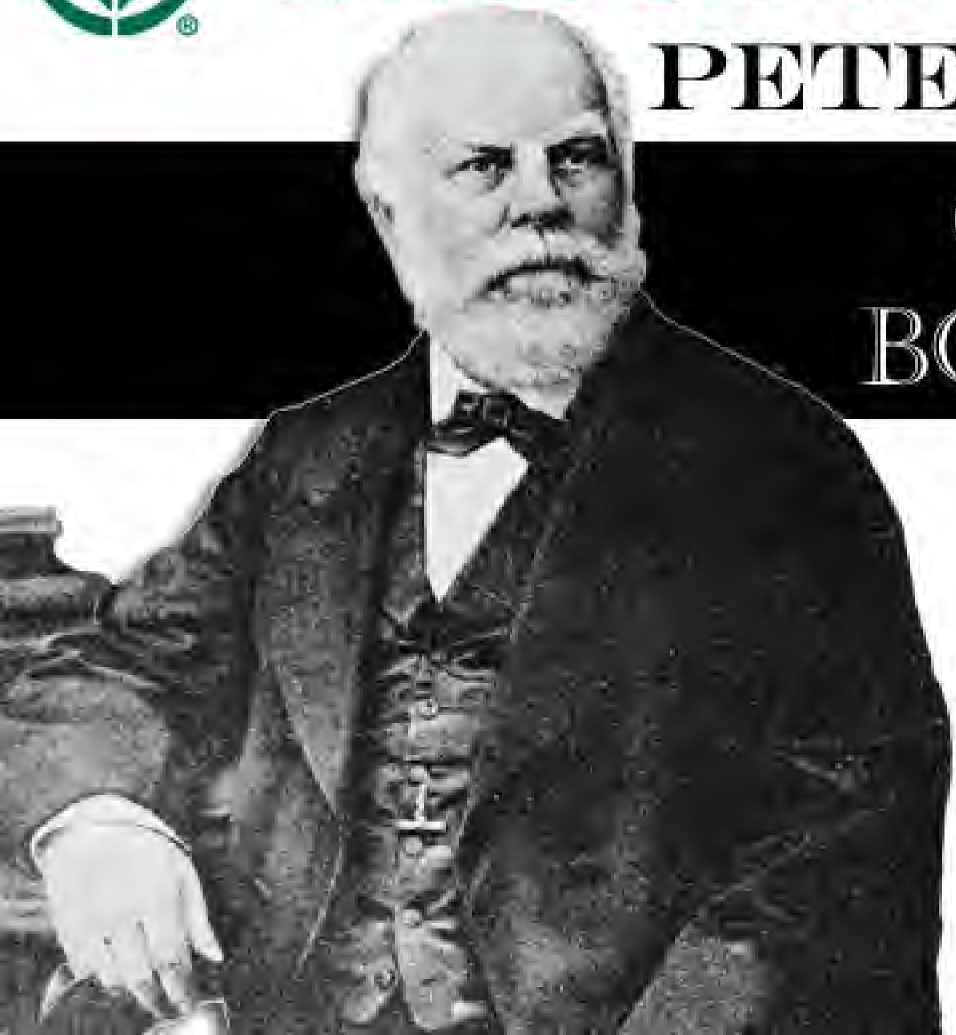

GEORGE ENGELMANN BOTANICAL NOTEBOOKS

Pagination Note:
Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

Ephedra antisyphilitica, Berlandier

Pl. Mex exsicc. n. 1590 C. A. Meyer Ephedr. p. 101 (1846)
Carr. Synops. Conif. p. 263
fide Carrière ~~Conifères~~ (1855) p. 560.

Eph. Americana Torr. in Stansb. Rep. p. 395 (4' high)
(Eph. occidentalis Torr. (lapsu calami pro Americana) in Emory Rep. p. 157
3–4' high
has 3 parted sheaths with long subulate points – Stansb. Rep. l. c.)
E. trifurcas (sic) Torr.
E. antisyph. Berl. Torry in Sitgreaves Rep 174
– – – – – – Bot. Whipple p. 140
— — — Bot. Boundary p. 207 with notes.
anthers mostly 4..

dioica Ephedra pedunculata, nov. spec.

fruticosa ~~squamosissima~~ squarrosissima, ramis numerosissimis verticillatis fasciculatis v. oppositis, foliis subulatis divaricatis vagina abbreviata bis terve longioribus deciduis; ~~amentis dioicis~~ ~~ad nodos~~ (inter ramulos) amentis dioicis ~~masculis~~ oppositis s. plerumque verticillatis ~~fasciculatim~~ aggregatis; masculis breviter pedunculatis, ovatis, perigonio super squamas membranaceo marginatas floralibus exserto, antheris ~~subb.~~ 8; femineis brevius longiusve pedunculatis; squamis 16 basi per paria connatis ~~vaginis ternis~~ ovatis obtuse ovula bina includentibus; seminibus (trigonis acutis) squamas subcarnosas (non plane maturis) paullo (quarta parte fere) superantibus.

×× Sandy & saline deserts near Walker River western Utah, ~~also common in mountain parts of Utah~~". near Camp Floyd on Rocks
also in other parts of Utah

This ~~species of~~ This shrub grows usually about 2–4 feet high, but has occasionally been observed to attain a hight of 5 or 6 feet. The largest stems seen had a diameter of [illegible]–4 inches. The grayish bark finally ~~dividing~~ ~~dissolves~~ separates into very fine, almost capillary fibres; the wood is almost white rather compact but not hard; the annual

layers are not easily distinguished, and apparently less than half a line thick. The joints in vigorous specimens are 1/2–2 inches long, but ~~often~~ sometimes much shorter; the ~~sheath~~ flower bearing branches (always at least 1 year old) are rather stout, 3/4–1 line thick; the ~~lea~~ subulate divaricate but not reflexed leaves are (from their ~~base~~ insertion) 2 1/2–3 1/2 or 4 lines long, united at the base ~~into a~~ by scarious membranes ~~[illegible]~~ they forming ~~to~~ a sheath 3/4–1 line in length; in the flower bearing branches leaves & sheaths have entirely disappeared. — The aments of flowers are usually crowded at the base of the accessory verticillate branchlets, or on their lowest joints, and are interspersed with young ~~and growing~~ shoots. Male & female ~~plants~~ plants are always separate on diff[erent] stems, have naked pedicels of 1 line. The ~~sterile~~ minute aments about [illegible] they are oval, 4–5 lines in length, consisting of 6 or 8 and even 10 pairs of fleshy (with a membranous margin) scales, each bearing ~~the anth~~ in its axil a (vagina, compressed as all the species of this genus do) with a transverse slit at the obtuse apex, emitting the connate filaments ~~and bear 6 or~~ with usually bearing 8 anthers or sometimes less; × The ~~latter are~~ sessile the upper on very short stipes. Anthers twocelled; once or twice I have observed a terminal pollen sac ~~usually longer on long~~; pollen grains elliptic. ~~The fertile aments are pedunculated, in~~

The peduncles of the ~~fertile~~ ~~fruit bearing~~ fruiting aments, ~~in fruit at least~~ are usually 2 and sometimes even 3–4 lines long; they bear at base several pairs of very small rudimentary scales, (~~and~~ if very long another pair about the middle), above which they are articulated; they are ~~generally~~ ~~[illegible]~~ commonly naked but if very long; the ament itself consists regularly of 3 pairs of (scales fleshy) united at base; the uppermost ~~being~~ ~~they~~ far the largest. The ~~seeds~~ I find almost ~~always~~ in pairs, ~~and very rarely single, in three cases only have I seen a single one~~ single, flattened on the inside obtusely carinate on the back, of an oval outline and with a rather obtuse point & perforated, from which like a style the elongation of the inner coat of the seed protrudes.

2. Ephedra.

The seeds (those at my disposal were not fully ripe) are rather over 3 lines in length, and the whole ament is about 4 lines long, the seed protruding not more than about 1/4 its length beyond the innermost scale. — The aments of several other spp. are pedunculate but none with ped. as long as in this (E. andina E. helvetica and others) ~~I distinguish this species from~~ E. antisyphilitica, Berlandier, at least for the specimens described ~~in~~ by Prof Torrey in the ~~Bot~~ Botany of the Mex. Bd. p. 207 from near El Paso (Wright n. 1883.) have less crowded branches, leaves in twos or usually in threes, subulate from a broad base, spreading or recurved, as long as their common sheath or shorter; ~~1/2 the length~~ 1/2 to at most 1 line long; aments closely sessile, not crowded, generally ~~dispersed~~ ~~spread~~ in pairs ~~along~~ on the branches, rarely in fours; closely ~~sessile~~; staminate ones subglobose or short-oval 3-4 lines long, consisting of 5 or 6 or rarely 7 pairs of floriferous scales, with the ~~[illegible]~~ vagina of the stamens scarcely protruding over the scale; anthers 4-5 or 6, ~~the pistillate~~ The fruit bearing ament is about 4 l. long composed of ~~about~~ 5 or 6 pairs of scales, which are membranous on the margin; and its ~~seed usually about 4 lines long~~, the seed ~~is~~ ~~usually~~ single, ~~is~~ acuminate and protruding 1/3 or even 1/2 its length over the scales. —

— I am not quite sure that this is Berlandier's plant (from Laredo) which is described ~~by~~ by C. A. Meyer as having the sessile aments crowded ~~at~~ the base of the [illegible] ~~verticillate~~ fasciculate branches, like ours in E. pedunculata.

A third western species ("from the "Del Norte and the Gila"") had been doubtfully indicated by Prof Torrey in Emory's Report p. 152 under the name of E. trifurca, Torrey (see also Torrey in ~~Sitgreaves'~~ Stansbury's Report p. 395). Dr Wislizenus has collected the same ~~form~~ near Valverde south of Santa Fe, but ~~also~~ without flower or fruit. It is a stouter plant, with stricter growth, erect verti-

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ostlate branches, joints abt 1½ inches long; leaves ~~erect~~, always in threes, subulate very ~~acutely~~ sharply pointed strictly erect, 2 lines long, shorter than the long sheath (2–3'' long), or of the same length, ~~partly~~ somewhat persistent. Mr Wright's no 1884 from ~~the banks of the Rio~~ ~~Grande~~ the country above El Paso, which has been described by Prof Torrey in the Botany of the Mex. B. p. 208 is the same plant; the ~~male~~ ~~sessile~~ aments ~~appear~~ are sessile in pairs along the branches or in clusters at their base; the male aments are small and globose (abt 2½ l. long) shorter than the persistent ~~and lacerate~~ but torn sheathes and leaves; the female aments have been described by Prof Torrey, but whether those large ~~[illegible]~~ membranous thin striped scales are very curious ~~they or very curious~~ shape is owing to a monstrosity ~~may be doubtful~~ as suggested, ~~may be~~ must remain doubtful, as the ovary seems to be perfect. — Moreover several other species of Ephedra appear ~~to be somewhat analogous to this~~, such as E. alata Dne, E. lomatolepis Schrenk, approach this somewhat in this particular;

The North american species of Isoëtes & Marsilea.
by Prof. Alex. Braun communicated by Dr G. Engelmann.
Octob. 1846

Dr A. Braun, since last spring Professor of Botany at the University of Freiburg, Germany, has from time to time communicated to me the result of his investigations of the cryptogamous plants of the U. States. His notes ~~investigations~~ on Charae and on Equiseta have been published in a former number of this Journal; I am now enabled to offer some remarks ~~about~~ on the above named ~~[illegible]~~ Genera of Rhizocarpous ~~Cryptogamous~~ plants. Those on ~~Isoëtes~~ the ~~have been published in~~ Marsilea have been furnished in manuscript; the paper on Isoëtes was published in a Flora or botanische Zeitung, No. 12, 1846. ~~I translate this first in the words of Prof Braun~~ Prof B. says thus: ~~Prof B. says in this paper~~:

~~The species~~ The species of Isoëtes hitherto discovered in ~~North America~~ the United States (especially one found in Pennsylvania) have been considered identical with the European I. lacustris Lin. But this as well as two others obtained ~~in distant~~ from that country ~~prove to be~~ on careful examination prove to be distinct species. The true I. lacustris, if ~~found at~~ growing ~~occurring~~ any where in North America, must be looked for in the northern regions.

Within a few years ~~Durieu~~ ~~a few years ago~~ Three new species of Isoëtes have been discovered by Durieu in Algeria and were described ~~a few years~~ by Bory under the names of I. Hystrix I. longissima and I. Durieui.

~~The communications of~~ ~~[illegible]~~ My friends Engelmann & Shuttleworth have enabled me to describe here three more species, so that the number of the known species ~~known~~ is at present 9 or with the two fossil ones, 11. It is to be expected that this number will be considerably increased by future researches, as the species of Isoëtes are easily overlooked by collectors on account of their apparent sterility.

All the species examined by me can be distinguished by the~~ir size~~, ~~shape~~. different size and surface of their spores. Other differences are to be found in the shape of the rhizoma, and in the ~~appx~~ ~~section~~ characters furnished by the section of the leaves. This last can only be observed in living plants, the ~~other charact~~ shape of the rhizoma may also be seen in dried, but not much pressed specimens. Collectors should pay attention to these circumstances.

In the general habit all the species are very much alike; some ~~grow~~ are found only under water as the european I. lacustris which never reaches above the surface of the water; also I. flaccida & I. longissima; Other species ~~often~~ grow in shallow water, or on wet places ~~and are frequently above the surface or in~~ which frequently become quite dry; so I. setacea, I. Engelmanni & I. riparia. Some others again grow on perfectly dry hills, as I. Durieui & I. Histrix. The I. setacea of the south of Europe grows often also on dry places. Perreymond has found it near Frejus at the foot of walls, forming dense patches of a beautifully green colour. I have cultivated this species in flowerpots, which were kept moderately moist and I will here take occasion to remind travellers & Collectors, ~~that~~ which may meet with species of this genus, that all of them are very tenacious of life much like bulbous plants, and may in the same way obtained for botanical gardens. The specimens of I. setacea, cultivated by me had been preserved ~~nearly~~ ~~years~~ in the herbarium near two years, when I had the pleasure ~~in the~~ (to see them vegetate) soon after throwing them in water) X.

~~For the~~ so I enumerate both european species with the north american, so that they may be compared together.

1. I. lacustris L. middle ~~& northern Europe~~
2. I. Engelmanni mihi Missouri
3. I. riparia Engelm. mss. Philadelphia
4. I. setacea Bosc South Europe
5. I. flaccida (Shuttlew.) Florida

The first, I. lacustris, ~~is found~~ has been found only in middle & northern Europe. It is distinguished from all others by thicker, stiffer dark green (in the herbarium blackish-green) leaves, and large spores, ~~covered with~~ irregularly covered with ~~tubercles~~ granulations. Its rhizome ~~is~~ measures sometimes ~~one~~ inch in diameter. The leaves are mostly straight and 6-8 inches long; a variety with shorter 2-3 inch leaves which are recurved at tip occurs rarely probably in shallow water, as the leaves never rise above the surface.

I. Engelmanni has been (by Dr E.) distributed to many correspondents as I. lacustris var. microspora, and was by him afterwards distinguished by him as a species, and named I. microspora; but ~~as~~ as this name ~~proposed by the discoverer~~ is not being sufficiently characteristic, ~~as~~ the spores ~~of this Isoetes~~ ~~are~~ being not much smaller than those of I. lacustris and other species having much more minute ones, I have taken the liberty to give it the name of its discoverer. While I. lacustris inhabits at least in middle Europe only the bottom of cold ~~mountain~~ lakes mostly with Nuphar Spennerianum and Sparganium affine, this species grows ~~in the shallow~~ on the margin of shallow ponds in the hilly country southwest of St Louis in the warm climate of Missouri ~~in company~~ ~~of~~ with Cephalanthus, Lycopus angustifolius, some Carex, Sagittaria, Leersia Polygonum etc. In the Spring it is covered by water, but late in summer and in the fall ~~it is so~~ the ground on which it vegetates is mostly dry, or nearly so.

It forms thick bushes with many leaves, 9 to 12 inches high, of yellowish green colour; the rhizoma is also flat depressed ~~and often one to [illegible]~~ ~~[illegible]~~ one inch in diameter ~~[illegible]~~ The dilated base of the leaves, which bears the

x, The places where it has been collected as late as 1842 are now altered by cultivation or the vegetation destroyed by ducks & hogs, and I have ~~since~~ not been able to find it, since ~~[illegible]~~ but doubt not that ~~there~~ it still inhabits [illegible] more secluded ponds in this remarkable region, where ~~[illegible]~~ the ~~formation~~ strata of the carboniferous (or mountain-) limestone offers in ~~their~~ numberless "sink holes" (originating ~~formed~~ undoubtedly from the caving in of the roof of caverns, and peculiar in this region at least to this ~~[illegible]~~ formation [illegible]) many localities of a similar description. E.—

Sporangia is longer and the sporangia themselves somewhat larger than in any of the other species.

I. riparia has been described from specimens collected by Dr Wm Zantzinger on the banks of the Delaware below Philadelphia, where ~~[illegible]~~ it grows on gravelly soil between high & low water, therefore frequently exposed to the air and on dry soil. The specimens examined by me are small, the rhizoma hardly (~~one third to one~~ ~~half of an inch~~ 4 to 5 lines) in diameter the leaves 4 to 6 inches long, narrower than in I. Lacustris, only 10 or 12 in number, (I. ~~lacustris~~ Engelmanni has oft 30-40 and more); ~~[illegible]~~ their base is shorter than in both ~~[illegible]~~ mentioned before, and the sporangia only half as large as in ~~I. Engelmanni~~ the last.— ~~The~~ I was not able to examine specimens of the Isoetes, found in Pennsylvania on "Ponds and shaded wet places" and mentioned in Darlingtons Flora ~~of~~ Cestrica ~~could be examined~~, ~~[illegible]~~ nor any from New York state, and it is not known whether they are ~~perfect~~ identical with I. riparia.—

I. setacea is common in the south of Europe especially in the south of France and in Sardinia and also in Northern Africa, and is sufficiently well known; The bushes are always smaller than those of I. ~~riparia~~ Lacustris or Engelm. but larger than

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~~those of~~ I. riparia; the leaves are ~~thinner~~ narrower than in the 2 last species and 8 to 12 inches long.

I. flaccida has been discovered by Rugel in Lake Jamonia in Florida and has been first distinguished ~~distributed~~ and named by Shuttleworth. It has a ~~ff~~ small roundish rhizoma, leaves ~~of~~ 18 to 24 inches ~~length~~ long, as ~~thin~~ narrow as in I. setacea, but of thinner texture and somewhat transparent; sporangia smaller, and spores by far the smallest of all those enumerated here. I am ~~not yet able to~~ not at this moment prepared to decide, what relation this species bears to I. longissima Bory, from Lake Houbeira in Algeria, or to an Isoetes from California, which Kunze considers identical with I. longissima, but which ~~might~~ perhaps belongs to the florida species.

The north american Marsileae form a peculiar group, very much distinguished from the european species by ~~the short raphe and~~ the large purple stomata of the capsule, which is always single at the base of the petiole, and the two ~~large~~ conspicuous approximate teeth of the raphe.

Marsilea uncinata (A Br.) ~~capsules~~ fruit basilar & single; stipes erect, nearly twice the length of the capsule; capsule horizontal oval or suborbicular, considerably compressed, truncate behind, with a long raphe, which terminating in two approximate teeth, the ~~lower~~ upper one being the longest and uncinately recurved; ~~caps~~ stomata of the capsule large, purple; paleae appressed; 13 to 14 sori on each ~~both~~ sides in the capsule; – ~~foliola of the frond~~ leaflets narrowly fanshaped entire, naked.

Marsilea mucronata A Br. fruit basilar & single; stipes ascendent, hardly as long as the capsule; capsule nearly horizontal or slightly ascending, ~~oval~~ somewhat obliquely ovate, slightly compressed, rounded above, carinate below, truncate behind, with a shorter rhaphe, which terminates in two approximate teeth, the upper one being the longest and straight or slightly ~~re~~curved at the point; stomata of the capsule large and purple; paleae appressed, indistinct; 8-9 sori on each side in the capsule; ~~Foliolo~~ Leaflets spathulate, entire, slightly hairy.

Marsilea vestita (Hook & Grev) fruit basilar & single; stipe erect, hardly as long as the capsule; capsule ascending oval, somewhat compressed, with a short rhaphe, which terminates in two approximate teeth, ~~of the which~~ the lower one being short and blunt the upper one acute, a little larger, hardly curved; ~~Stomata of the capsule large and purple~~ paleae long dense and somewhat patulous; — 7-8 sori on each side in the capsule; — leaflets entire covered with paleaceous hairs. — (Stomata of the capsule not seen in the young specimens examined by me, but undoubtedly similar to those of the other species, only more hidden by the paleae (A.Br.);

This last (species was the first of this genus discovered in North america. It was× described and figured by Hooker & Greville (Icones Filicum tab 159.) ×, ~~from~~ collected by Douglass on the Columbia river, Oregon, and was

The whole plant is small, petioles 3 to 4 inches long ~~densely~~

The radicant stem or rhizoma is ~~entirely~~ coated with long hairlike paleae, like the fruit and to some extent also the leaves. The description of H. & Gr. mention only one tooth on the fruit, but their figure shows both. (Oregon this species)

Marsilea mucronata is nearly related with ~~it~~ but sufficiently distinguished by the nakedness of the plant, and especially by the shape of the capsule. the rhizoma is ~~long, creeping~~, elongated and without the fasciculated branches of the following; the petioles are 2 to 3 inches long, and the (spathulate or slightly fanshaped) leaflets ~~about~~ 3 to 4 lines long. It was collected by Mr Geyer in Nicollets North western Expedition July 24th 1839 in small dried up swamps ~~ponds~~ near Devils Lake (in the North west Territory between the Mississippi & Missouri. It is ~~[illegible]~~ mentioned by Prof Torrey in the Catalog of Nicollets plants (appendix to N's report pag 165 as M. vestita. — ~~The This species~~ In several European herbaria ~~is~~ it is preserved under the name

of M. quadrifolia (Herb Ward) — from where deriv
is unknown to me. —

M. uncinata ~~has~~ been discovered by ~~Dr Engelmann~~ the translator of ~~these~~ notice in July 1835 on the ~~margins~~ of small ponds in the ~~[illegible] shady bottom~~ deep bottom lands of the Arkansas river below Little Rock with Azolla caroliniana etc; ~~It~~ was first described under ~~this name~~ in Flora, or botanische Zeitung 1839 I p. 300. = It is a much larger plant than both others, nearly naked, ~~scantily distant~~ ~~[illegible]~~ with long petioles (~~[illegible]~~ 5 to 9 inches long) and fan shaped leaflets 6 to 10 lines long; — the rhizoma ~~is shorter and~~ produces ~~forms~~ many fusiform branchlets which are paleaceous at tip. — But the shape of the capsule ~~as many~~ and the number of ~~which contains nearly twice the number of~~ sori (~~[illegible] on each side~~) ~~than the others~~ in it distinguish it ~~easily~~ at once from the others. —

Note. Besides these 3 species I have received a fourth one from Mr Lindheimer, collected by him ~~[illegible]~~ in swampy soil on the lower Guadeloupe, near its mouth in the Matagorda bay (Texas). ~~It is~~ widely distinct from the three others by having ~~the~~ long and branching stipes (10-14 lines long), ~~which are three or four times as long as the capsule~~, ~~and~~ bearing 3 ~~to~~ 5 capsules, ~~[illegible]~~ 3 or 4 times as long as these, and at base connected with the petiole; capsule obliquely oval, with short raphe, lower tooth blunt, upper one very indistinct; stomata not observed on the paleaceous capsule; rhizoma nearly naked, only the ends of the branches paleaceous. petioles 4 to 9 inches long, hairy; leaflets more or less covered by fine paleaceous hairs, triangular to fan shaped, entire, 7-12 lines long. — It is not improbable that this is ~~the~~ Marsilea polycarpa Hook & Grev. found throughout south America and lately discovered in Mexico by Schiede? of which plants however I have not seen a description ~~the same plant, I believe~~ ~~has been~~ also ~~collected in texas by Drummond~~ ~~but I have only seen sterile specimens~~; to the same species probably the sterile specimens ~~have~~ have to be referred, which were collected in Texas by Drummond ×.

Geo. Engelmann.

× If the texan species should on further comparison prove to be distinct from the south american Marsilea, the name M. macropoda would appear to be most appropriate

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Isoetes lacustris, submersed, rhizoma placenta-shaped, depressed orbicular or irregular; leaves tubular, semi~~terete~~ cylindrical, above cylindrical, rigid, fragile, dark green; spores large with coarse farinaceous tubercules, irregularly roughened, scarcely reticulated.

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Linaria chalepensis Mill
Antirrhinum 〃 L
〃 album Lam
Asyris chalepensis Cyrill

Spr II, 793

Italia. Gallia austr.

H.B.Fr.1825

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166 Cycadaceae

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Marsilia & Rhizocarp

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Aconitum rectum Bernh

H. B. Fr 1824

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Ephedra Asiatica

Regel Plant nov. 1879

p. 193

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Cycadeae

Sachs' Botany   Cambridge Oct 4 1883

All the floral (or fertile, ♂ or ♀) leaves of Cycas [and all Cycadeae ?] form single flowers ~~And so are the cones of Coniferae single flowers. This last position is stated in so many words, but not further explained.~~

The male flower of Cycas have very numerous staminal leaves, much smaller than the carpellary leaves of the female, 7–8 cm long and undivided; they are furnished on the under side with a number of pollen sacs; the whole ♂ flower is from 30–40 cm long and probably not proliferous like the female flower regularly is [How does then the male plant further any grow? from a lateral bud ??, or does it die after once flowering ??]

[I find no statement, whether the female inflorescence is terminal and how the vegetation continues]

Cycas bears numerous ovules on the exposed and spreading carpels

but the other Cycadeae have concealed ovules & seeds (fertilized through a gap ~~in the~~ between the carpellary peltate scales, by insects probably)

Formation of the so-called pollen; the largest cell, emitting pollentube opposite the other, inert, cells

De Cand Prod 16² p. 523 Cycadaceae: Strobili mares solitarii vel plures in gemma non centrales; feminei solitarii interdum vere centrales et tunc vegetatio per axin ulterius progreditur [Cycas]

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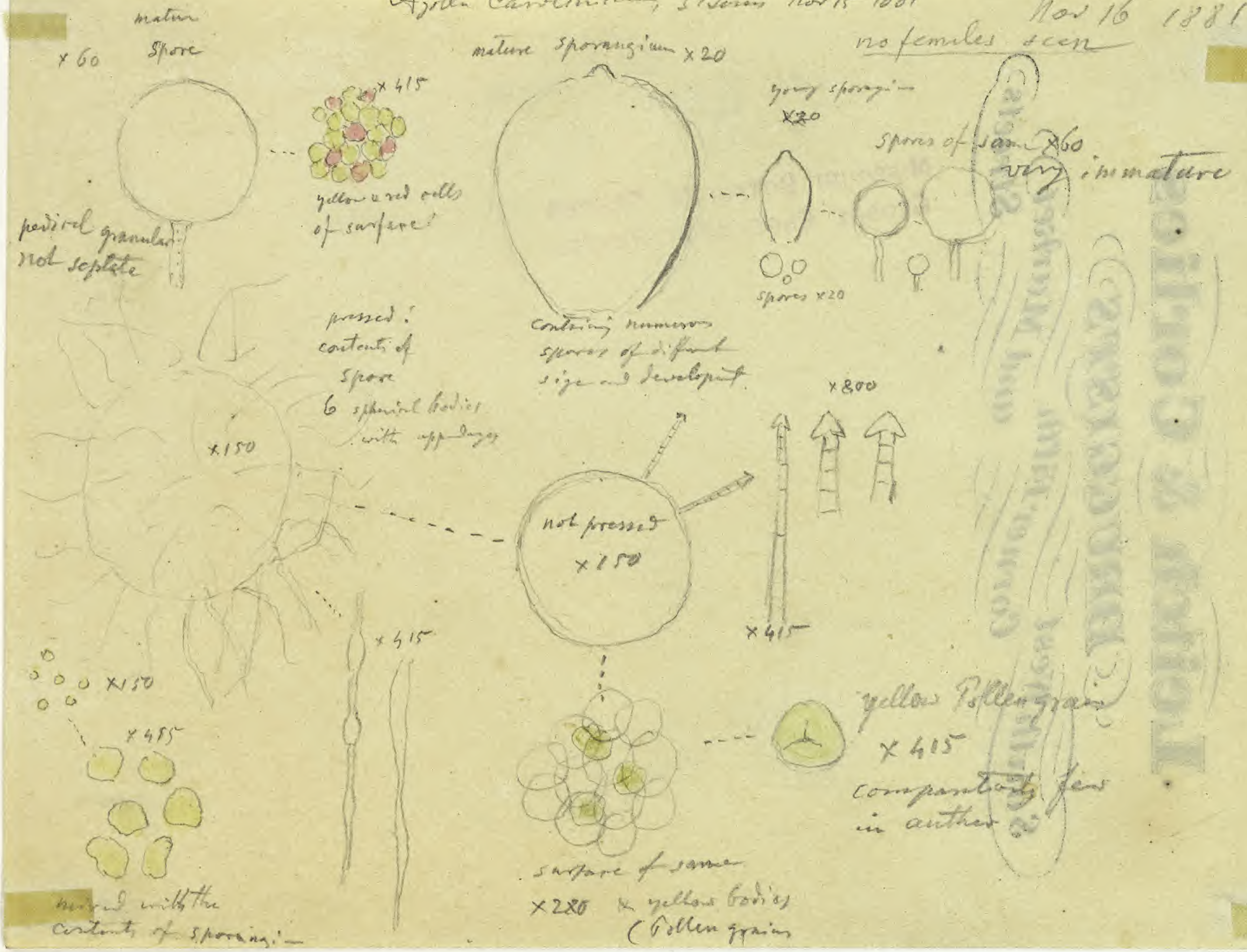
Azolla Caroliniana, St Louis Nov 15 1881

Nov 16 1881

no females seen


x 60
mature Spore
x 415
yellow & red cells of surface!
pedicel granular not septate
mature Sporangium x 20
Containing numerous spores of different size and developmt.
young sporangium
x20
Spores x20
Spores of same x60
very immature
pressed! contents of Spore
6 spherical bodies with appendages
x 150
not pressed
x 150
x 800
x 415
x 415
x 150
x 485
mixed with the contents of sporangium
surface of same
x 280 & yellow bodies
(Pollen grains
yellow Pollen grain
x 415
comparatively few in anther

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Leitch & Corlies
DRUGGISTS
South West Corner Fifth and Market Streets

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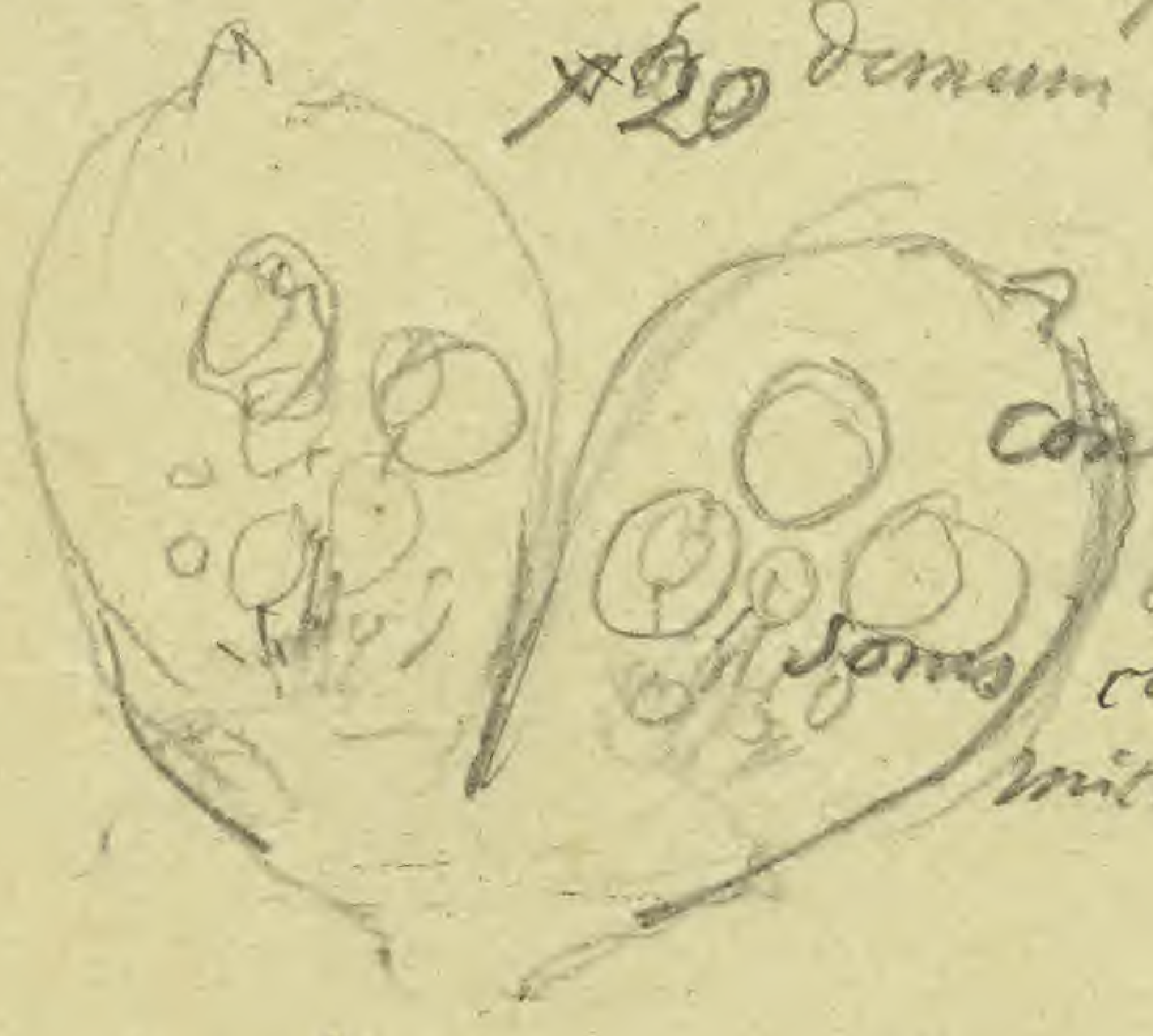
Azolla ♂

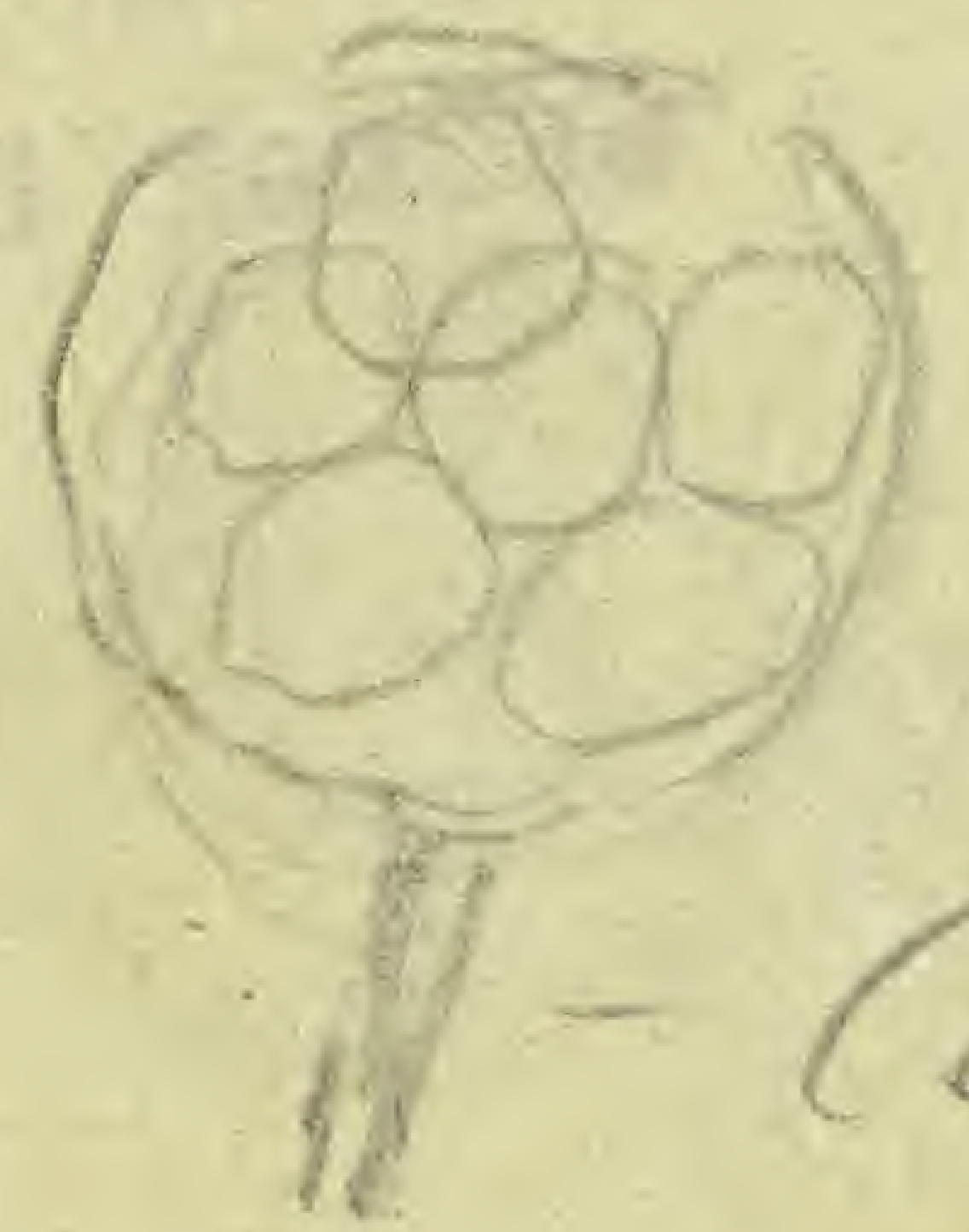
Mettenius, Azolla Nilotica 1864

conceptaculum completum demum clausum

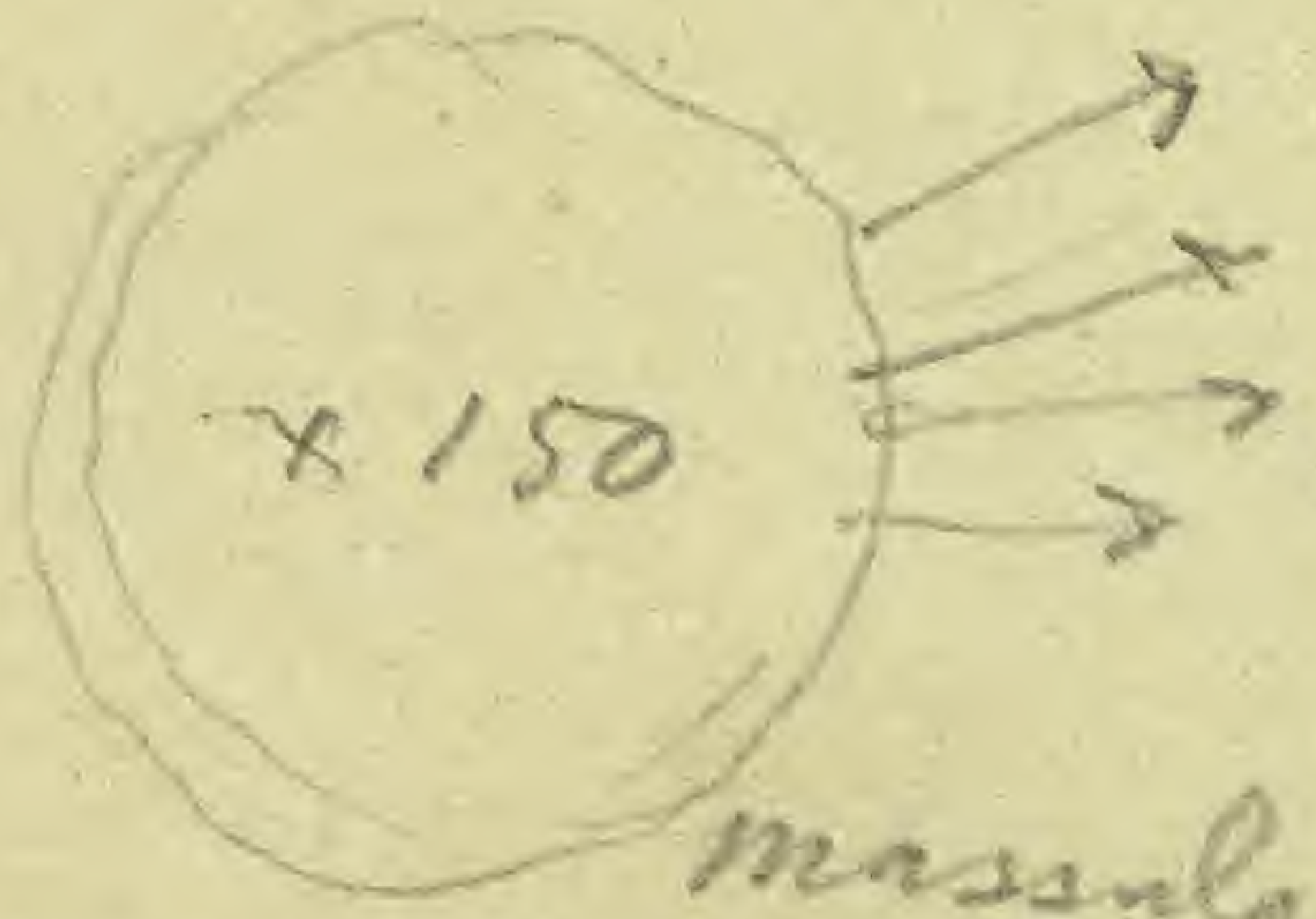


conceptaculum (olim: receptaculum)

sori geminati



microsporangium cum 6 massulis (olim: Anthera)



processus uncinatæ

massula microsporarum cuticula communi conglobatarum

Grana pollinis (fide Mettenii i Linnaea 1847)

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Leitch & Corlies

DRUGGISTS

South West Corner Fifth and Market Streets

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